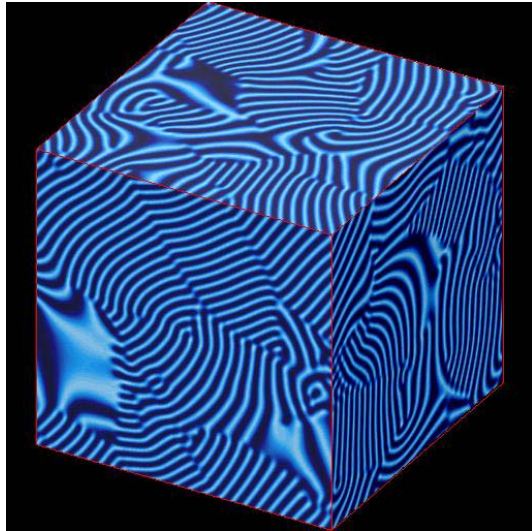


# Formation and stability of lamellar mesophases

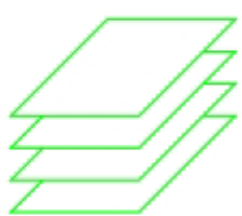
Jorge Vinals, Florida State University, DMR-0100903



Lamellar mesophases of block copolymers are materials that self-assemble into modulated phases of tunable wavelength (of the order of nanometers). The anisotropy in composition (color scale in the figure) is key to applications.

Applicability limited by long range disorder from processing. This is a typical polycrystalline sample with a distribution of lamellar orientations.

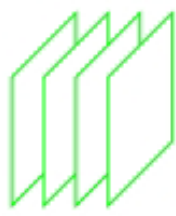
Shear flows investigated to produce samples of controlled macroscopic orientation.



Parallel



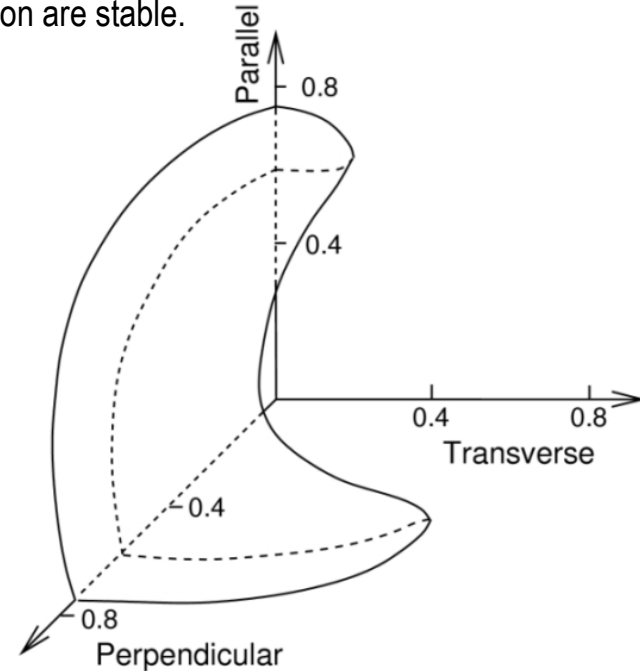
Perpendicular



Transverse



Stability diagram of ordered lamellae as a function of orientation. Only states within toroidal region are stable.



States outside decay (three routes shown in the figures) until a stable state is reached

